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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/759,018	01/12/2001	Eric Vance Kline	FIS920000310US1	1799
32074	7590	10/04/2004	EXAMINER	
INTERNATIONAL BUSINESS MACHINES CORPORATION DEPT. 18G BLDG. 300-482 2070 ROUTE 52 HOPEWELL JUNCTION, NY 12533			PATEL, ISHWARBHAI B	
			ART UNIT	PAPER NUMBER
			2841	

DATE MAILED: 10/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/759,018

Applicant(s)

KLINE, ERIC VANCE

Examiner

Ishwar (I. B.) Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2002 and 15 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 1-3 and 14-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/12/01.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of group I, claims 4-13, drawn to a product, in the reply filed on March 20, 2002 is acknowledged. The traversal is on the ground(s) that claim 4 of group I require the particulars of claim 1 of group II, and the field of search of group I will include the search for group II. This is not found persuasive because the restriction is between group I and group II, and not between the individual claims. Further, invention of group I is product and does not need the in depth search of the invention of group II, as the invention of group II has many other industrial uses, than that of the invention of group I, and will be burdensome to the examiner to search both the invention of group I and group II.

The requirement is still deemed proper and is therefore made FINAL.

Oath/Declaration

2. In view of the papers filed on May 3, 2002, it has been found that this nonprovisional application, as filed, through error and without deceptive intent, improperly set forth the inventorship, and accordingly, this application has been corrected in compliance with 37 CFR 1.48 (a). The inventorship of this application has been changed by adding the name of David Clifford Long.

The application will be forwarded to the Office of Initial Patent Examination (OIPE) for issuance of a corrected filing receipt, and correction of the file jacket and PTO PALM data to reflect the inventorship as corrected.

Specification

3. The disclosure is objected to because the detail about the immobile particle not described to be enabled to a person of ordinary skill in the art to make and /or use the invention.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 4-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 4, states "an immobile particle" and " a chelating agent bonded to said immobile particle". However, it is not described in the specification, as to what is the structure of said immobile particle and how the chelating agent is bonded to the immobile particle. "Immobile" means incapable of being moved, Merriam-Webster's collegiate dictionary, tenth edition. Any particle, which is fixed on the circuit board, will be an immobile particle. Circuit board with all its components will be immobile; any coating on the board, including any kind of filler will be immobile. Even the resin coat and its constituent parts, used on the device or used as any component of the device

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will be immobile. Only mention of the immobile particle, as described on page 6 of the specification is "the inventive composition 100 includes a very high molecular weight insoluble and immobile particle 110 and a chelating agent 120 which is permanently bonded to the immobile particle"

For the examination purpose the examiner considered the chelating agent as an element / one of the additives of the polymer composition used.

Claims 5-13, directly or indirectly, depend upon claim 4 and inherit the same deficiency.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 4-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Regarding claim 4, the applicant is claiming an immobile particle and a chelating agent bonded to the immobile particle. However, the structure of the immobile particle is not clear and also, it is not clear how the chelating agent is bonded to the immobile particle. "Immobile" means incapable of being moved, Merriam-Webster's collegiate dictionary, tenth edition. Any particle, which is fixed on the circuit board, will be an immobile particle. Circuit board with all its components will be immobile; any coating on the board, including any kind of filler will be immobile. Even the resin coat and its constituent parts, used on the device or used as any component of the device will be

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immobile. Only mention of the immobile particle, as described on page 6 of the specification is "the inventive composition 100 includes a very high molecular weight insoluble and immobile particle 110 and a chelating agent 120 which is permanently bonded to the immobile particle"

For the examination purpose the examiner considered the chelating agent as an element / one of the additives of the polymer composition used.

Claims 5-13, directly or indirectly, depend upon claim 4 and inherit the same deficiency.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 4 and 5, to the extent understood by the examiner, are rejected under 35 U.S.C. 102(b) as being anticipated by Berger, US Patent No. 4,030,948.

Regarding claim 4, Berger discloses an electronic device having an integrated circuit (semiconductor element 10, figure 1 and 2) with a composition, said composition comprising: an immobile particle; and a chelating agent which is bonded to said

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immobile particle (34, figure 1 and 2, layer of silicone containing polyimide with chelating materials admixed or chemically bonded thereto (column 4, line 1-45).

Regarding claim 5, Berger further discloses said composition is said composition is contained within a scratch coat (34, figure 1 and 2) covering an active surface of said integrated circuit.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 6-9, to the extent understood by the examiner, are rejected under 35 U.S.C. 103(a) as being unpatentable over Raiser et al., US Patent No. 6,700,209, in view of Berger, US Patent No. 4,030,948, as applied to claims 4 and 5, above.

Regarding claim 6, the applicant is further claiming said integrated circuit is bonded to a package.

Berger does not disclose such package.

Raiser et al., discloses a flip chip electronic package 10 mounted on a substrate 22, figure 1, with underfill material 26 and encapsulant 24.

As disclosed by Raiser et al., it is well known in the art to mount an integrated circuit in a package to have required input/output connection and to connect the integrated circuit with other element of the device.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to provide the integrated circuit of Berger in a package, as taught by Raiser et al., in order to provide device with input/output connection for the desired functionality.

Regarding claim 7 and 8, Raiser et al., discloses encapsulant deposited substantially an entire surface of said integrated circuit and between said integrated circuit and said package, see figure 1, but, fails to disclose said encapsulant with said compositions. Berger discloses the coating material with said composition as a coating material for getting the desired property to avoid undesirable degradation of electrical properties of the semiconductor device.

A person of ordinary skill in the art would have recognized the advantage of providing coating material with the composition having chelating agent to have desired property to avoid undesirable degradation of electrical properties of the semiconductor device.

Further, it has been held to be within general skill of a worker in the art to select a known material on the basis of suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the package of Raiser et al., with the encapsulant having the composition having chelating agent, as taught by Berger, to have the desired properties to avoid undesirable degradation of electrical properties of the semiconductor device.

Regarding claim 9, the applicant is further claiming said package comprises an organic package and wherein said composition is contained within said package. Raiser et al., does not disclose the detail of package substrate 14.

Burger, in an embodiment, figure 5, discloses a substrate made of resin, which is an organic material and the composition 160, is contained within the package.

As disclosed by Burger, the use of organic package is well known in the art, as economical and commercially available.

Further, it has been held to be within general skill of a worker in the art to select a known material on the basis of suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the package of Raiser et al., made of organic material with the composition contained within said package, as taught by Berger, to have the desired properties to avoid undesirable degradation of electrical properties of the semiconductor device.

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Regarding claim 10, the combination of Raiser et al., and Berger further discloses the device further comprises a printed circuit board (Raiser, 22, figure 1).

13. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Raiser et al., and Berger, as applied to claims 6-10 above, and further in view of Ikeda et al., US Patent No. 5,973,930.

Regarding claim 11, the combination of Raiser et al., and Berger, discloses all the features of the claimed invention, including the printed circuit board, but fails to disclose an underfill deposited between said package and said printed circuit board.

Ikeda et al., discloses underfill 7, figure 1, between the package and the printed circuit board 9, to disperse the stresses caused by the difference in thermal expansion, column 4, line 4-8.

A person of ordinary skill in the art would have recognized the advantage of providing underfill between the package and the circuit board to disperse the stresses caused by the difference in thermal expansion.

Therefore, it would have been obvious to a person of ordinary skill in the art to provide the combination of Raiser et al., and Berger, with the underfill deposited between the package and the circuit board, in order to disperse the stresses caused by the difference in thermal expansion, and further the underfill with chelating agent to avoid undesirable degradation of electrical properties of the semiconductor device.

Regarding claim 12, the combination of Raiser et al., Berger and Ikeda et al., discloses the composition contained within said printed circuit board, as applied to claim 9 above.

Regarding claim 13, the combination of Raiser et al., Berger and Ikeda et al., discloses the composition contained within conformal coating which is deposited said integrated circuit, said package and said printed circuit board, as applied to claims 4, 6 and 12 above.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, showing the package structure and composition similar to applicant's claimed invention.

US Patent No. 3,886,080, Schucker et al.,

US Patent No. 6,469,074, Hino et al.,

US Patent No. 5,814,226, Tavlarides et al.,

US Patent No. 4,499,149, Berger,

US Patent No. 6,369,449, Farquhar et al.

US Patent No. 5,535,101, Miles et al.,

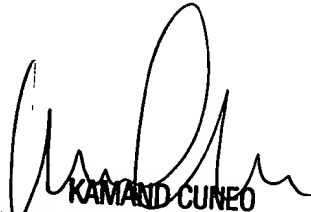
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (571) 272 1933. The examiner can normally be reached on M-F (8:30 - 5:00).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571) 272 1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

I B Patel
Examiner
Art Unit: 2841
September 27, 2004



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